GARDEN AND FOREST.

PUBLISHED WEEKLY BY

THE GARDEN AND FOREST PUBLISHING CO.

OFFICE: TRIBUNE BUILDING, NEW YORK.

Conducted by . . . . . Professor C. S. SARGENT.

ENTERED AS SECOND-CLASS MATTER AT THE POST-OFFICE AT NEW YORK, N. Y.

NEW YORK, WEDNESDAY, NOVEMBER 10, 1897.

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New Dangers to Public Parks.

IN praising the man whose recent death means a heavy loss to the readers of this journal, and in noting his long usefulness as the most keen-eyed and devoted defender of the public parks of New York, the daily papers have dwelt forcibly upon the dangers which threaten these parks from the "assaults of the ignorant and vicious." But the parks are threatened by other dangers, newer than these, more subtile and insidious, less easily recognized as dangers, and therefore less likely to be frankly and forcibly resisted. And the consciousness of this fact greatly augments, among those who keep close watch upon our parks, the regret which every intelligent American must have felt when he heard of the death of Mr. Stiles.

The ignorant and the vicious have long been enemies of the parks—persons who deny their utility because it cannot be translated into terms of dollars and cents; those who are eager to injure them for the sake of giving to the city something, advantageous, perhaps, in its own way, which they think of more "practical benefit"; who wish to exploit them for their own profit or who plan to fill them with ugly objects; who barbarously injure their grass, trees, flowers or monuments for their own mischievous pleasure; or who think they know more about caring for them than their professional superintendents, and therefore try to "arouse the public" whenever a dying tree is cut or any other needful and desirable work proposed.

These people represent the unintelligent, uncultivated and unconscientious elements of the population. They are now recognized as enemies of the public, which in some degree is on its guard against them. Teachers, champions and leaders are still needed to defend the parks from their possible attacks. But the public is now easily roused to oppose their worst efforts; and it is probable that no such bold assault upon Central Park will again be attempted as the effort made a few years ago to run a speedway through it, or the equally horrible one to turn part of it into a barren parade-ground. And the public may likewise be counted upon, although not so confidently, to forbid the attempts of individuals to dot it with penny-in-the-slot machines or newspaper kiosks, or otherwise to disfigure it and to pervert it from its true service for the profit of personal greed under the pretense of supplying special "conveniences" or "pleasures" to its frequenters.

The danger to our pleasure-grounds from engineers necessarily employed upon them, but devoid of the right artistic feeling and unwilling to abide by the counsels of landscape-gardeners, has recently been dwelt upon in these pages and may for the moment be passed by. What we wish now to point out is that it seems probable that more and more schemes to further definitely intellectual or æsthetic ends will be prosecuted without due regard to the integrity and beauty of our parks as works of landscape-art, and that the patrons of science and literature and of art of other kinds are likely to try to injure our great artistic creations like Central and Prospect Parks. And this is, of course, a very insidious danger, as the schemes may be worthy in themselves, and the people who urge them are those whom the public has been told it should trust most implicitly in intellectual and artistic matters.

It is at least a question whether the new Public Library should have been allowed to claim the site of the old reservoir on Fifth Avenue, which otherwise would have been added to the area of Bryant Park. The Metropolitan Museum should not have been given a site within Central Park, but placed beyond its limits, as the Museum of Natural History was upon its western borders. And the stand which Mr. Stiles took, as Park Commissioner, in opposing the desires of the Botanical Society—which, if carried out, will seriously impair the peculiar beauty of Bronx Park and its utility as a public pleasure-ground—must convince all the readers of this journal, who know of his devotion to botany and horticulture and to the task of spreading an interest in them among the people at large, that here, too, a great mistake has been made, and by just the kind of persons who ought to be trustworthy guides with regard to the right conservation of the public's park-lands.

These few instances illustrate one phase of apprehension—the danger that buildings for public purposes will more and more absorb the narrow and precious spaces set apart for the people's refreshment and enjoyment. Each such instance is deplorable in itself and as a precedent for future enterprises of similar kind. Nor is New York the only city which needs to be warned along these lines. The beautiful park which Mr. Olmsted laid out in Buffalo is threatened with the erection of buildings which would be public benefits if placed elsewhere, but public misfortunes as features in a naturalistic park. Even the small and incomparably precious State Reservation at Niagara Falls has had to be defended against a misfortune of a like sort; and there is no town in the United States whose parks are safe in this respect. It is high time that the public should awaken to the fact that no buildings whatsoever, except those absolutely required for park purposes proper, should be allowed within a park, and that the projectors of all others should buy their own sites or, if these must be purchased with public money, that they should be placed outside of park limits.

This is not merely because every foot of open public land is precious as such and should be held sacred to serve the health, the refreshment, and the outdoor pleasures of the people. It is also because, almost without exception, our pleasure-grounds are works of landscape-art in the exact sense—naturalistic parks—and are necessarily injured in their artistic character by the intrusion of buildings even of the most beautiful kinds. This is the point which many artists do not understand, and, therefore—as they are naturally regarded as the highest authorities in artistic matters—the damage which may be done to our parks by those who have not a true comprehension of them is, per-

haps, more to be dreaded than that from any other class of men.

It was hailed as a very good sign when, only a few years ago, American architects began to interest themselves in the environment of their buildings, and to regard it as an integral part of the works of art which they wished to create; but there are many indications that it is not always realized that while in some cases planted grounds must be mere adjuncts to buildings, in other cases the grounds are themselves the primary and important work of art, and that in the latter case no artificial object should be placed within them which does not serve their own proper purposes or enhance their own intrinsic beauty. As yet architects and sculptors do not always understand these truths. Individually and in corporate ways they have recently shown a great interest in the parks; they have done many things to improve them, and have prevented the doing of many things which would have injured them. But they have also proposed, if not achieved, some things which would be of lasting detriment; and the danger is that, as their interest in our pleasure-grounds develops they will more and more come to regard them as mere frames and settings for their own products, or possible exponents of their own gardening ideas. If sculptors and architects ever regard our parks simply as "good places" for the display of monuments and statues, they may grievously wrong the community by defacing its most precious artistic possessions. A man naturally intent upon showing his own work to advantage is easily tempted to think that the best site for it is the place where it will be most conspicuous; and the wide-open areas of a park specially appeal to his desires in so crowded and ill-planned a city as New York; but it is certainly clear that parks like Central Park are in themselves more valuable, even from the artistic point of view, than any object which can be placed within them, and that their beauty is of such a kind that it may easily be marred by the intrusion of an object in itself artistic. An architect may find it difficult to realize that the creation of a formal passage may fatally injure a work of landscape-gardening, planned in accordance with artistic laws less fixed and rigid than those of their own art, but none the less logical and binding, and this point of view sometimes leads him to think he understands the whole subject and is capable of "improving" the best work of such a master as Mr. Olmsted. This is no vague and unsupported assertion. It is well known that one of the most prominent and highly cultivated architects in New York has long declared that a straight boulevard ought to be run all along the eastern side of Central Park, within its borders, and has actually prepared a plan for such a boulevard and wished to have it adopted by the city authorities—a plan for a piece of inartistic vandalism quite as glaring as the once-proposed speedway along the opposite side of the park.

In short, Central Park and almost all other American parks are naturalistic parks—are works of landscape-gardening, and their artistic value and greatest usefulness will be impaired by the intrusion of any building, however excellent it may be in design or useful in purpose, or of any statue or other monumental work, however great its artistic or historical value. Our great parks are country parks, and they are valuable to city communities not as museums or statue galleries, but as bits of country where the weary and discouraged can draw new breaths of life and hope from country sights and scenes.

The Twenty-second Annual Report of the Commissioners of the Department of Parks of the City of Boston is before us and shows that up to the end of last year the Department had expended $6,165,780.47 for land and $7,568,099.24 for construction, or with $13,356.10 for betterment expenses, a total of $13,747 235.81, against which $361,334.96 has been collected for betterments. The report shows that the work of completing the parks was industriously carried on during the year. About two millions and a half are still needed to finish them according to the original designs of the landscape-gardeners, including nearly $300,000 for buildings. The Commissioners suggest, however, that these estimates can be considerably reduced. The most significant thing in the report to those interested in the best development and care of the Boston parks is the announcement that during the year the services of a competent superintendent and general manager for the system have been secured, and that the irresponsible dual management, which has always existed since Boston has had parks, has at last been abandoned.

The following extract from the report of the landscape-gardeners, Olmsted, Olmsted & Eliot, to the Commissioners is of such general interest to all parkmakers that we are glad of an opportunity to reproduce it for their benefit: "There are certain parts of the parks, especially along the borders of waters and in existing rocky woodlands, where we have designed to have unusually wild and natural effects. For the gardener to plant in such situations exotic trees and showy garden shrubs and perennials would go far toward defeating the essential elements of our designs. The roads and paths of 'country parks' are placed in certain positions so as to command certain landscapes or bits of scenery thus and so, and conversely the vegetation, which in this climate makes the scenery, must be controlled, encouraged or modified accordingly. Unless planting, thinning and clearing are thus done sympathetically, the courses of the roads become meaningless and their cost is wasted."

Notes on Cultivated Conifers.—VI.

Thuya, or Arbor-vitæ, is a genus of four species, two being North American and two east Asiatic. It is well distinguished by its erect cones ripening at the end of their first season and composed of oblong, slightly imbricated, acute scales usually with from two to four seeds under each scale. All the species are pyramidal aromatic trees with flattened, lateral, pendulous or erect branchlets disposed in one horizontal plane and forming an open distichous spray, and dimorphic leaves. The species are grouped in two sections—Euthuya, to which belong the two American and the Japanese species, and which is distinguished by pendulous branchlets and thin, leathery, oblong, acute, mucronulate cone-scales, those of the two or three middle ranks being larger than the others and fertile, and by its compressed light chestnut-brown seeds with broad lateral wings and minute hilums. The second section, Biota with a single Chinese species, is distinguished by erect branchlets and thicker and conspicuously umbonate cone-scales, the lowest four usually being fertile, and by its much-thickened dark red-purple seeds rounded or obscurely angled on the back and marked by large oblong conspicuous hilums.

The type of the genus, Thuya occidentalis, the Arbor-vitæ of gardens, is a native of eastern North America, being distributed from Nova Scotia to the shores of James Bay and Lake Winnipeg, and southward through the northern states and along the Alleghany Mountains to southern Virginia. It is an inhabitant of wet ground, often at the north covering great areas of springy swamplands with impenetrable forests or growing on the rocky borders of streams in situations where its roots can obtain an abundant supply of water, while at the south, where it is comparatively rare, it is found only on the banks of mountain streams. Under favorable conditions it occasionally attains the height of fifty or sixty feet and forms a stout much-branched and buttressed trunk sometimes six feet in diameter. Such specimens, however, are exceptionally large, and trees thirty or forty feet in height, with trunks two or three feet in diameter, are much more common. The Arbor-vitæ was probably the first American tree cultivated in the Old World, as it was known in Paris gardens before the middle of the sixteenth century, and

Belon in 1558, in the first book devoted to conifers, published the earliest description of it.

Too stiff and formal, perhaps, in outline, when it is planted as an isolated specimen on high ground, where it usually appears out of place and out of harmony with its associates, the Arbor-vitæ is admirably suited for massing on the borders of streams and lakes, where it properly belongs and where it harmonizes with its surroundings. It bears clipping well, and its value as a hedge-plant was shown many years ago by Mr. A. J. Downing, who made it popular in American gardens for this purpose. Few trees show a greater tendency to seminal variation, and many forms have been raised and propagated by nurserymen, no less than forty being described in a recent European work on conifers, while there are several others known only in American gardens. Many of these forms show their distinctive characteristics only while young, and soon grow into the normal form, and in some cases several names have been given to the same plant originating independently in different nurseries. It would not be profitable to describe even a few of the most distinct of these plants, for any one who will sow a quantity of Arbor-vitæ seeds will be sure to find among the seedlings a number of forms as novel and interesting as any now in cultivation. It is, however, worth stating again, perhaps, that a plant commonly known in this country as the Siberian Arbor-vitæ is a form of Thuya occidentalis which originated several years ago in Ware's nursery, in England, and that it is correctly called Thuya occidentalis Wareana. All the abnormal forms of Thuya occidentalis can be propagated by cuttings, which strike readily, and among them are some exceedingly dwarf compact plants which are sometimes useful in small gardens and on the margins of beds of larger conifers.

The plants commonly cultivated under the name of Thuya plicata are garden forms of our eastern Arbor-vitæ, and must not be confounded with the Thuya plicata of Don, which is more frequently known as Thuya gigantea, although Dr. Masters has recently clearly shown that Thuya plicata is the older name. This is the Arbor-vitæ of north-western America, the Red Cedar of Oregon and Washington, the greatest of all the Thuyas, and a veritable giant among conifers. Near the shores of Puget Sound it is a common occurrence to see this tree 200 feet high with a massive trunk gradually tapering from a base fifteen or sixteen feet in diameter. As it grows in its native forests it is one of the most beautiful and graceful of the American conifers, with bright cinnamon-red bark and a narrow spire of branches, which sweep out gracefully from the stem, and are clothed with great Fern-like, pendulous, yellow-green branchlets. Nowhere forming pure forests, the western Arbor-vitæ grows singly or in small groves generally on low, moist bottom-lands or near the banks of streams, and less commonly on dry ridges and mountain slopes, which it sometimes ascends in the interior to considerable elevations, although it is only at the sea-level and under the immediate influence of the ocean that it grows to its greatest perfection. Ranging along the coast from southern Alaska to northern California, it penetrates also eastward along the banks of mountain streams through southern British Columbia and Washington to the western slopes of the northern Rocky Mountains, and is abundant on the Bitter Root and Cœur d'Alene ranges and in the territory north of Flat Head Lake. Plants obtained several years ago from this interior and comparatively dry region have proved hardy in the Arnold Arboretum, and in Mr. Hunnewell's Pinetum, where they are now growing rapidly, and promise to become large and handsome trees. In western Europe Thuya plicata flourishes, and large specimens are now common in European collections, in which a few seminal varieties with abnormally-colored foliage are preserved.

The Japanese Arbor-vitæ, Thuya Standishii, is a rare inhabitant of the mountain forests of the main island, and occurs only on the borders of streams and lakes usually at elevations of 4,000 or 5,000 feet above the level of the sea. It is a small pyramidal tree occasionally thirty feet high, and very like our eastern Arbor-vitæ in coloring, but of more open and graceful habit. For thirty years it has been an inhabitant of American and European gardens, where it is much more generally known as Thuyopsis Standishii than by its true name. There is a well-formed and perfectly healthy specimen of this tree about eighteen feet high in Mr. Hunnewell's Pinetum.

The Chinese Arbor-vitæ, Thuya orientalis, the type and only member of the section Biota, is a small bushy tree with bright green foliage, and an inhabitant of the mountain districts of central and northern China. Long supposed to be a native of Japan, where for centuries it has been a favorite garden plant and where a number of abnormal forms have been perpetuated, it was probably one of the numerous plants carried by Buddhist priests from China to that empire, whence it found its way to Europe a hundred and fifty years ago, and now in all temperate countries it is one of the most commonly cultivated conifers. Hardy in sheltered positions as far north at least as eastern Massachusetts, the Chinese Arbor-vitæ is more common and far more vigorous and beautiful in southern than in northern gardens. Many varieties of this plant are propagated in European nurseries, but none of them is as hardy here as the typical form. The most remarkable of these varieties, perhaps, is the plant with long slender, flexible pendant branches (var. pendula) found by Thunberg in Japanese gardens and once believed to be a distinct species. In English and French gardens a dwarf globose and compact form (var. aurea) raised many years ago in the Knapp Hill Nursery, at Woking, is a favorite ornament. This plant has not proved hardy at the north, although south of New York it can be successfully cultivated. On this form the early spring growth is rich golden yellow, changing late in the season to the normal light green of the species. Thuya orientalis, Meldensis, which originated at Meaux, in France, in 1853, and was formerly considered a hybrid between Thuya orientalis and Juniperus Virginiana, is a juvenile state of the Chinese Arbor-vitæ, with acicular spreading leaves. All these plants, like all other Cupressineæ, can be propagated by cuttings which usually root rapidly.

Thuiopsis chiefly differs from Thuya, to which some authors unite it, while others consider it a Cupressus, in its ligneous cone-scales, much thickened and dilated at the apex, each bearing five seeds. The only species, Thuiopsis dolabrata, which is one of the most beautiful conifers of Japan, is easily recognized by its broad coriaceous leaves, which are convex and bright green above and concave and silvery white below, and are arranged in four ranks in opposite pairs, those on the upper and under side of the branchlets being closely appressed against the stem, while the lateral leaves are more or less spreading. In central Hondo this tree is common between five and six thousand feet above the sea-level, growing as an undershrub in the dense shade of Hemlock forests, and every year buried in snow during four or five months. Sometimes it rises, however, when its crown reaches the light, to the height of forty or fifty feet, with a slender trunk covered with bright red bark, long, graceful drooping branches and a narrow pyramidal top. It is a tree which evidently requires shade and protection, at least while young, and in its native forests even the largest plants are surrounded and overtopped by taller trees.

In western Europe Thuiopsis dolabrata grows admirably, and there are already handsome, well-formed specimens in many of the gardens of southern England and Ireland and western France, but in this country it suffers from summer drought, and unless it is protected from the winter sun it soon perishes or becomes shabby and unsightly, although in sheltered positions it is hardy enough in eastern Massachusetts, and if winter conditions similar to those it enjoys in Japan and sufficient summer moisture could be given to it here, it might be expected to succeed. A form in which the

tips of some of the branchlets are white (var. variegata) has come from Japanese gardens, which have also given us a compact form with rather more slender branches and lighter green foliage than those of the ordinary form (var. nana), and there are one or two other varieties represented by names, at least, in European collections.

Libocedrus bears in many respects a close resemblance to Thuya, from which it chiefly differs in the structure of the fruit, which is composed of four or six scales, those of the lower pair being thin, reflexed above the middle and much shorter than those of the next pair; these are thick, woody, and wide-spreading at maturity, while the two inner scales when these are present are confluent into an erect woody septum. Eight species of Libocedrus are now known. One of these species is a native of semitropical south-western China; two are scattered through the mountain forests of western South America, from Chili to Patagonia; two inhabit New Zealand; two New Caledonia, and one western North America, where it ranges from southern Oregon along the mountains to Lower California. This, the Libocedrus decurrens of botanists, is a noble tree often one hundred and fifty feet in height, with a tall, slightly lobed trunk covered with bright cinnamon-red bark and sometimes seven or eight feet in diameter, and slender branches which are clothed with flattened pale yellow-green frond-like branchlets and which, erect above, and below sweeping downward in graceful curves, form for a century or so a narrow, open feathery crown which later becomes irregular in outline by the greater development of some of the branches which from horizontal become upright, and secondary stems.

Libocedrus decurrens has been cultivated in Europe for more than forty years and has already grown there to a considerable size, promising to become a long-lived and large tree. In the city of Washington there are good, healthy specimens in the grounds of the Department of Agriculture and of the Soldiers' Home, and this tree appears to be hardy near Philadelphia and New York. In New England it has not been sufficiently tested yet, but as its range is coextensive with that of the Sugar Pine, which is hardy in eastern Massachusetts, it is possible that it can be made to thrive in this part of the country if it is obtained from a cold, dry region like that at the eastern base of the Cascade Mountains of southern Oregon, or from northern California. It may be worth mentioning that in at least nine out of every ten European nurseries, owing to the mistake made by one of the early seed collectors in western America, Libocedrus decurrens is sold as Thuya gigantea, while the true Thuya gigantea, or, as it is now called, Thuya plicata, is sold as Libocedrus decurrens.

C. S. S.

Plant Notes.

Spiræa arguta.

THIS plant, one of many hybrid Spiræas raised at the Forest School at Munden by Dr. Zabel, is a decided acquisition as a garden plant, and one of the most beautiful Spiræas in cultivation. It is described by Dr. Zabel * as a hybrid between Spiræa multiflora, itself a hybrid between S. crenata and S. hypericifolia, and S. Thunbergii. Flowering very early with S. Thunbergii, it surpasses that plant in the gracefulness of its arching branches, its more abundant and larger flowers, and in its greater hardiness, the ends of the branches of Spiræa Thunbergii being almost invariably killed by the cold of northern winters, which occasionally also destroys a large part of the flower-buds.

Spiræa arguta in the Arnold Arboretum, where it has been growing since 1893, is now about four feet high, with slender stems covered with lustrous red-brown bark and furnished near the extremities with numerous elongated, clustered, arching wiry lateral branches, which about the first of May, just as the leaves are unfolding, are covered on the upper side with crowded umbels of pure white flowers a quarter of an inch in diameter, and raised on slender pedicels about half an inch in length. The pale green leaves are oblong-obovate, entire below and coarsely toothed at the acute apex.

Our illustration on page 443 of this issue, from a photograph made at the Arnold Arboretum by Mr. James F. Codman, represents the end of a stem of Spiræa arguta with its numerous lateral flower-bearing branches which, erect in the illustration, are pendent on the plant.

* *Die Strauchigen Spiräen der Deutschen Gärten*, 22.—*Gard. Chron.*, ser. 3, xxii. 3, f. 1.

Foreign Correspondence.

London Letter.

Nymphæa O'Marana.—Kew is indebted to Mr. H. A. Dreer, of Philadelphia, for a tuber of this hybrid Water-lily, and the plant has been an attraction among the tropical aquatics for the greater part of the summer. It was described in Garden and Forest (vol. viii., page 96), where its origin is stated to be due to a cross between Nymphæa dentata and N. Sturtevantii, the latter a hybrid of rare quality, but, with us, not free-flowering. In its bright rose-pink color, with an almost pure white stripe down the middle of each of its two dozen or so broad petals, N. O'Marana differs from all other tropical Nymphæas. Mr. Dreer states that with him the flowers were from twelve to fifteen inches in diameter. At Kew they have not exceeded nine inches. Probably, however, the flowers are larger when the plants are grown in full sunshine. In my opinion this is one of the three best forms of N. Lotus, the other two being N. dentata (white) and N. Devoniensis (red). If we add to these N. Zanzibarensis (blue-purple) we have a quartette of the best tropical Nymphæas.

Crested-flowered Begonias.—The latest "freak" of the tuberous Begonia is the development of a plumose crest on the inner surface of the petals, not unlike that developed by the Persian Cyclamen. This crested Begonia originated in a Continental garden, the stock being secured by a nurseryman who has lately distributed seeds from which a large proportion of the plants raised has possessed this crested character. It is noteworthy that sports of this nature are hereditary, for Messrs. Low & Co., to whom we owe the origin of the crested Cyclamen, found that ninety per cent of the plants raised from its seeds had crested flowers. At present the crested Begonia is merely a curiosity; some growers call it a disfigurement, but there is no saying what it may lead to. A Begonia with flowers like a Cockscomb Celosia would no doubt find many admirers. "The case of cresting shows that the plant possesses the power to strike out a new line and to develop characters which would even be regarded as having specific value," has been said.

Begonia Gloire de Lorraine.—One of the most charming exhibits recently seen at the meetings of the Royal Horticultural Society was a group of about thirty plants of this Begonia. Each plant grew in a five-inch pot and was eighteen inches high and wide, forming a compact ball-like cluster of bright green leaves and elegant rose-pink flowers. They were grown by one of our cleverest market nurserymen, Mr. May, of Edmonton. I mentioned this hybrid in a letter last December, but, good as the plants were that I had seen then, they are eclipsed by those now noted. Some of the Socotrana hybrids are "miffy"; indeed such plants as Winter Gem and John Heal may be described as difficult to manage, but Gloire de Lorraine is as easily grown as Begonia Dregei, one of its parents. In addition to its good qualities of freedom of growth and charm of flower it has also that of durability, plants in flower in October remaining in beauty until February or March, the racemes gradually extending in length until they have long flexuose stalks. It is a most valuable winter-flowering plant for the warm greenhouse.

STREPTOCARPUS.—We have now a great range of flower color among the hybrid Streptocarpus, and along with it a habit and leafage which commend the plants to the grower of decorative plants more than the earlier crosses did. It is now generally known that several species were originally crossed to produce this race, the species used being widely different from each other. This fact makes it very remarkable that the crosses are now so far fixed in character that the various colors will come true from seeds. In the case of Primula Sinensis, the garden Cineraria, and the Persian Cyclamen the colors generally are reproduced from seeds, but I do not know of another instance where distinct species have been crossed for the progeny to be thus exactly reproduced. In the Gladiolus, Begonia and other genera seeds are of no value for purposes of propagation if the reproduction of the characters of the seed-bearer is desired.

Fig. 56.—Spiræa arguta.—See page 442.

Messrs. Veitch & Sons have now many new hybrids of this genus.

PRIMULA TRAILLI.—This is a form of Primula involucrata (Munroi), one of the many species of Primula found on the Himalaya, where it grows at an altitude of from 12,000 to 15,000 feet. Forms of it are also found in Europe, northern Asia and Arctic America. It is hardy at Kew and is remarkable for its tall scapes bearing nodding umbels of about half a dozen pure white, very fragrant flowers. A figure of the type will be found in Lindley's *Botanical Register*, 1846, t. 31. Mr. G. F. Wilson, who has lately raised, flowered and exhibited plants of P. Trailli, is of opinion that it differs specifically from P. involucrata, but the differences as set forth by him in *The Gardeners' Chronicle* this week, where his plant is figured, are only those of size, and there are specimens in the Kew Herbarium of P. involucrata quite as large as his plant. The dimensions of this are: Breadth of tuft, twelve inches; length of leaf, including oblong blade, six inches; flower-stems, of which his plant produced ten, sixteen inches; umbels three to six flowered. It is a charming Primrose for a cosy corner of the rock garden.

CALLISTEPHUS HORTENSIS.—This is the plant popularly known as the China Aster, the Aster Chinensis of Linnæus. It was introduced into the Jardin des Plantes, Paris, from China, about a century ago. The many changes wrought in its character, amounting to racial distinctions almost, we owe chiefly to French breeders, first among whom we may mention Monsieur Vilmorin. The type had long ago disappeared from cultivation, and so far as I can gather, no colored picture of it existed, so that we knew little of the character of the progenitor of the China Aster beyond what herbarium specimens showed. Now, however, thanks to a French missionary in China and Messrs. Vilmorin & Co., we have the type again in cultivation, and a batch of plants raised from seeds supplied by the latter and grown in a border at Kew reveal it as a plant of decided beauty, "far more elegant in habit and beautiful in flower than any China Aster I have ever seen," was the remark of a gardener-artist who saw the Kew plants. These formed an irregular group from twelve to eighteen inches high, branched freely and clothed with healthy dark green toothed leaves. The flowers were from three to five inches in diameter, with a broad yellow disc surrounded by a single row of broad strap-shaped ray florets, colored pale mauve. The charm of the flowers was in their elegant

pose, their singleness and pleasing colors. Unfortunately, the plants have not seeded at Kew, but probably they have done so in the nursery of Messrs. Vilmorin & Co. in the south of France. The original China Aster is as certain to find admirers as the single Dahlia and the single Chrysanthemum.

Chrysanthemum Nipponicum.—I recommended this new Japanese Daisy last year as a pot-plant to flower in winter. Some plants of it grown at Kew out-of-doors with the common Chrysanthemums have made compact bushes a foot high and are now bearing erect daisy-like flowers with yellow disc and white ray, each flower being three inches across.

A Model Nursery.—The late Mr. Bause was one of the most successful breeders and growers of indoor plants in Europe. After having served some of the principal London nurserymen he started a nursery for himself at Norwood, near Sydenham, about fifteen years ago. He died two years ago and his nursery is now controlled by his son, a young man, but a worthy successor of his father. I saw his nursery a few days ago and was so struck by the order, cleanliness and first-class cultivation there that I venture to call it a model of what a plant factory should be. The plants grown are all tropical and the houses are span-shaped, of various lengths, fifteen feet wide, the sides three feet, the central ridge eight feet high. The stages are formed of slates resting on iron battens and these are covered with a thin layer of cocoa-fibre or cinders. There is a wide central, and two narrow side stages, the paths being two feet wide. Seven rows of four-inch hot-water pipes afford the necessary heat. The stages are packed with plants of various sizes, all in the most perfect health, while on the hot-water pipes are rows of shallow boxes containing Palm seeds. Mr. Bause's specialties are Cocos Weddelliana, Geonoma gracilis, Kentia Fosteriana, Phœnix rupicola and Livistona Sinensis. Of each of these he sells from ten to twenty thousand plants a year, mostly from two to three feet in height. The cultivation is so excellent that almost every Palm bears every leaf it has developed from the seed to its present three, four or five year old condition. "My customers would not stick to me if my plants were not as perfect as I can make them," said Mr. Bause. Dracæna terminalis and all the very best of the Dracænas of that section are grown in large numbers and in the most perfect manner, every leaf as clean, well formed and richly colored as possible. Mr. Bause, senior, raised nearly all the best of these Dracænas during the time when he was manager to the General Horticultural Company. Crotons are grown on an equally large scale and to the same degree of perfection. Caladiums are another specialty, Mr. Bause having raised a large number of beautiful seedlings, most of which have been sent out by Messrs. J. Veitch & Sons. Nepenthes are grown suspended from the roof in almost every house, perfect little plants in teak baskets, each bearing perhaps half a dozen matured leaves, from each of which hangs a large, well-colored pitcher. Mr. Bause grows all the best sorts, including such rarities as the true N. sanguinea, and even a plant or two of N. Rajah. I asked what special manure was used. "None," said Mr. Bause, "but we get the best soil we can and take special care as to the water, shading and ventilation." This is one of dozens of plant factories in the suburbs of London whose special function it is to grow the best plants in the best manner for the supply of the big nurseries.

London. *W. Watson.*

Cultural Department.

Carnation Notes.

WE are now in the height of the Chrysanthemum season, and while these are at their best Carnations and other less showy flowers are liable to suffer some neglect. But though Chrysanthemums are supreme for a few weeks, Carnations, with proper attention, bloom satisfactorily during the whole year. Chrysanthemums are unquestionably the popular flower during part of October and November, but the public soon grows weary of them, and Carnations are assuredly the flower of the masses and are a close rival of the rose in popularity.

The weather this autumn has been remarkably clear and warm and especially delightful during October. There have been but light frosts up to this time, and summer-flowering Carnations are still blooming quite freely, although these flowers, naturally, compare unfavorably with those now growing under glass. Few private places have special houses devoted entirely to Carnations. Chrysanthemums usually occupy some of the bench room at this time, and the temperature and atmospheric conditions have to be regulated to suit them. No particular harm is done to Carnations so early in the season by a slightly lower temperature; the nights are not yet sufficiently cool to render much fire-heat necessary, and as the houses become well warmed during the day Carnations open quite rapidly. The plants are now growing freely and the flower-stems are appearing abundantly on all varieties. No time should be lost in providing the plants with supports. We formerly tied up the plants loosely to wire rods held in position by wires drawn along the rows. While this system produced a neat effect, it had disadvantages. Some varieties of recumbent habit, like Daybreak, were difficult to tie, and unless the ties were loosened from time to time as the plant grew, many shoots near the centre became weak, spindling and almost blanched. A Carnation support which will give satisfaction to everybody has not yet been invented. All the air and light possible should reach every part of the plants. This is impossible when they are tied up in a bunch, as we too often see them, with a piece of white twine or raffia. We have just gone over our plants and cleaned them, and instead of staking them up have cut up a quantity of small-mesh wire netting (commonly called chicken wire) into strips eighteen inches wide, doubled this into an acute arch, and stood it between the rows, which extend across the bench. This keeps the plants from crowding each other and allows sunlight and air to strike between the rows. Stretches of wire may be drawn along the sides of the bench to hold up the shoots and prevent them falling over. As the season advances and the stronger stems appear stretches of white twine should be drawn a few inches apart from each side of the bench and crossed at right angles; this will support the flowers. One advantage of this system is that the pieces of netting can be lifted out at any time when it is desired to stir the ground lightly and clean the plants, and this method is also advantageous in watering, as a hose can be passed inside of the arched netting. As to neatness there can be no question, for the plants practically hide the netting from view.

Rust is still more or less prevalent, but it appears to give less concern to growers than when it made its appearance a few years ago. A moist atmosphere, crowded, unclean and unsupported plants and uneven temperature will cause this disease to spread rapidly. Overhead watering must be avoided, since the water does injury by lodging in the axils of the leaves, and washes off the bloom of the foliage provided by Nature as a protection against spores. On the other hand, a comparatively dry atmosphere, careful watering and ventilation, picking off dead, decaying and diseased leaves, and keeping the house perfectly clean, with no rubbish thrown under the benches, will all tend to keep rust in check. Some growers find a dusting of air-slacked lime keeps rust from spreading, and we have used this preventive with success. A syringing with the arsenical solution on badly affected plants once a week has proved beneficial. Probably the Carnation which has rust in the most virulent form this year is the fine yellow variety, Eldorado. It was attacked last year to some extent, but not sufficiently to impair its flowering qualities. This season our plants were so badly affected that we threw them away, and the stock of other growers in this vicinity is more rusty than usual. It is unfortunate that Eldorado should be the victim of this disease, for it is the best yellow Carnation we have ever grown. Such varieties as Buttercup, Louise Poroch, Goldfinch and Bouton d'Or are not worthy to be included in the same class with it.

We are trying a few plants of the Mayor Pingree this season, sent out last spring by John Breitmayer & Sons, Detroit, Michigan. This proves to be a vigorous grower and throws up wonderfully strong flower-stems. The flowers thus far produced are large and of fine form. This is a promising variety which we shall watch with interest. William Scott, notwithstanding all that has been written about its failing popularity in the flower markets, is still planted as largely as ever by growers in this section. The variety which is to supersede it has yet to be introduced. Sorts like Edna Craig and Grace Battles, which were widely boomed before being sent out, are now never seen. Madame Diaz Albertine is almost altogether

discarded, William Scott being so much better. Bridesmaid is of little value, except when a few fine exhibition blooms are desired. Triumph, good in some parts of the west, has proved of no value as a persistent bloomer. Nicholson has had its day and appears quite run out. Rose Queen is only now and again met with. Abundance is a neat little plant for a side bench. Victor, one of the 1897 novelties, proves disappointing thus far. None of these varieties succeed except in certain localities, while William Scott seems to do equally well from the Atlantic to the Pacific, and is probably more extensively grown than all other varieties of its color. Among white varieties decidedly the best of the new sorts we have tried is Flora Hill, introduced by E. G. Hill & Co., Richmond, Indiana. The flowers are very large, freely produced and have a delightful odor. The plant is the most vigorous grower of any kind we have. Harrison's White, the so-called white William Scott, has proved disappointing; the flowers are few and of medium quality. Edith Foster is a very promising variety, with stiff stems and flowers of good size and form. Alaska is grown to some extent by commercial growers, but the small flowers do not usurp the place of those of Lizzie McGowan, which we still find to be the most prolific and best all-round white Carnation. This variety does not appear to be popular in the Boston market. The leading Carnation growers for that market seem unable to grow it successfully. In many New England cities hardly any other white variety is to be seen. Occasionally Mrs. Fisher is grown, and one cultivator in this vicinity has two houses devoted to it and refuses to grow any other kind. For summer flowering it is unapproached. Nivea, a slender-growing sort introduced by Mr. H. A. Cook, Shrewsbury, Massachusetts, is largely grown here this season, but it is not equal to some other sorts up to this time. F. Mangold is still the leading crimson. Meteor is generally discarded. Now and then a small planting of Sebec is seen; this is a good crimson Carnation and flowers finely outdoors in summer. It lacks a stiff stem, however, such as F. Mangold has. The new variety, Mrs. George M. Bradt, as seen in one of the houses of Mr. W. Nicholson, Framingham, Massachusetts, a few days ago, looked specially well; this is, without doubt, now the finest striped variety; the color is white, striped with scarlet. The flowers do not fade out as many of those on Helen Keller do, and it is far more prolific than Minnie Cook. Della Fox proved unpopular in the markets here last season and is generally discarded. Daybreak still holds its own as one of the most popular market varieties and continues to do well. Its habit of growth is not of the best, but no other kind has yet been sent out which will take its place. Maud Dean, white, with a blush centre, is a neat, compact-growing sort, but its color is not of the delicate shrimp-pink color which gives Daybreak its popularity. A first-class scarlet is still needed. Morello is a promising kind, but I think not so good as Jubilee. We still raise Hector, although it is not by any means an ideal grower. Such small varieties as John's Scarlet, Portia and E. G. Hill continue to be the leading market sorts here, and will probably be so until a scarlet variety with the many virtues of William Scott or Lizzie McGowan is introduced. Portia is perhaps the oldest commercial variety, largely grown for cut flowers, now on the market, as it is the healthiest.

Taunton, Mass. *William N. Craig.*

The Storing of Bulbs.

BULBOUS and tuberous-rooted plants are indispensable for the garden in summer, and each autumn the best method of storing the bulbs and tubers must be considered. A great number of these plants rest annually at this period, and unfortunately, the plants that are taken the best care of while growing are often sadly neglected when at rest. They are frequently put to one side after they have flowered, as if they did not need further attention until it is time to plant them. But it takes a bulb longer to recuperate after flowering than it does to produce a crop. Often the flower-stem and leaves may be found within the bulb seemingly ready to start and come into bloom in a few weeks; but months of preparation are necessary for this growth to be possible. The Hyacinth and Narcissus are instances. What are known as Holland bulbs are for the most part spring-flowering, and are now in a cool cellar buried in sand and ripening for planting. Most of the south African bulbs and others from various parts of the globe are inclined to take their rest at this time, fortunately, and we thus have a store to draw upon when winter and spring bulbs are past.

Amaryllis are steadily increasing in popularity. These plants are admirably adapted to house decoration and are easy to cultivate. Our stock has become so large that it is each year more difficult to store it. A cellar is not suitable, for at this time these bulbs need light and warmth to mature them. Much of the foliage is yet green, indeed A. aulica and its offspring are evergreen. It is unwise to cut off the stems and leaves, and these must die naturally. When the bulbs are perfectly at rest they may be stored under the benches or on shelves in the greenhouse; care must be taken that they do not become dust-dry or soaked with water. Amaryllis are for the most part deciduous, but a few roots will remain through the winter, and these are a great aid to the production of strong flower-spikes if they are properly taken care of and not allowed to rot or dry off. We are now starting a few of the bulbs which have matured earliest for an early display, and at the beginning of the new year all will be started. The only way to make up a collection of Amaryllis is to raise them from seeds of a good strain. Seedlings, however, are evergreen until they have reached maturity; that is, at the beginning of the third winter after sowing the seeds they begin to lose their leaves and should be treated like the older bulbs.

Gloxinias are, perhaps, the most showy of summer-flowering bulbs and are grown in large numbers. They are slow to go to rest if well grown and not neglected after blooming. We hesitate to dry off Gloxinias even at this time if they show no signs of drying, but give moisture as long as it is necessary to support the leaves that are building up the bulb to greater dimensions and vigor. After Gloxinias are dried off it is preferable to store them in the pots they grew in during summer. We frequently have not room enough to keep them in this way and they are shaken out and stored in boxes, soil being sifted in between the bulbs. Tuberous Begonias are treated in exactly the same way. If they have been used out-of-doors and have been cut off by frost they must be lifted and laid in an airy place until the stems part readily from the bulb, and then they may be put away in boxes. Both Begonias and Gloxinias are apt to suffer from what is known as dry rot in winter. A little moisture should be supplied to keep the bulbs plump, and then many of the root fibres will survive the winter and be an advantage in spring. It is often said that a place where potatoes may be safely wintered is suitable for storing Begonias and Gloxinias. I prefer a place with a little more warmth; a minimum of forty-five degrees is advisable, and certainly not more than fifty degrees as a maximum for any length of time if it is desired to have a late summer display.

At this time we shake Achimenes out of the soil in which they grew and use the pans for other bulbs. These bulbs may be picked out of the soil, placed in dry sand and kept perfectly dry during the winter if stored on a cool bottom in a cool house. We take the precaution to put a board under the pots or moisture would be drawn up by capillary attraction sufficient to start them too early, or at an inconvenient time. Our last Achimenes are just going out of flower; we find that these plants flowering late in September are a pleasing feature in the cool house; in the hottest summer months the flowers wilt at midday and the display is then short-lived.

We grow a large number of Japan Lilies for summer decoration, mostly of the L. speciosum type, and these have just been cut down and put in a cellar. There are no more valuable plants for use in late summer. To have them late it is advisable to store the bulbs in a cellar where there is moderate freezing. This will keep them dormant until it is safe to put them outdoors. If stored in a cellar that is frost-proof they will certainly start to grow before it is safe to have them outside, and in a glass structure their flowering period is hastened at least a month, and they will not last until the Japanese Anemones come in to take their place.

Nerides are valuable autumn plants and would, no doubt, be seen oftener if they did not take up so much valuable space in winter. As they flower first and then produce foliage they need care now. It is a mistake to repot them before they bloom, as we have found to our cost, but it may be safely done now. If it is not desired to increase the stock all the young bulbs may be taken off and thrown away. The point is to take the strain of support from the flowering bulbs or the display will be poor the next season. They should be potted according to their size, five or six bulbs in each pot. They should not again be disturbed for two years. With this treatment we have had a fine display this fall, and a good growth is now being encouraged.

Where summer decoration is required few plants lend themselves more kindly than the ornamental-leaved Caladiums. The set of Brazilian sorts shown at Chicago in 1893 has greatly increased the popularity of these plants, and they are becom-

ing better known each year. These are truly tropical bulbs, coming from under the equator, and cold is fatal to them, even for a short period. They must never be stored in a place where the temperature falls below fifty degrees, but above this degree of temperature there seems to be no limit. A friend winters his Caladium-bulbs on the pipes in a house where tropical Palms are grown; they are stored in the pots and soil in which they grew. A better plan is to shake out the bulbs at this time if the leaves have died off, and after cleaning off all decayed particles that are sometimes found at the base of the tubers, they should be placed in dry sand, new labels written for them, and stored in the boiler-cellar, as it is generally warm there. If decay is seen to have penetrated the tissues of the tuber, this must be cut away and some dry charcoal-dust mixed with a little sulphur be placed directly under the cut and filled round with sand. There will be no danger of losing valuable kinds if the bulbs are attended to in time. The newer English dwarf kinds are, without doubt, among the finest achievements of the hybridizers' skill, and reflect great credit on the raiser and distributers. Unfortunately, their price is almost prohibitory; but we have noticed that these highly-colored varieties are slow to increase, their vigor in this direction being dependent on the amount of green coloring matter contained in the leaves.

Gladioli, Acidantheras, Tritonias and Montbretias are all of the same nature from a cultivator's standpoint. They should be lifted in autumn as soon as frosts have killed off the tops. The new bulbs are then cleaned free of old roots and the old bulb that adheres to the base of the new one. After being laid out to dry for a few days in an airy dry place they are best kept in strong paper bags such as Holland bulbs come in. These should be suspended in a dry cool cellar free from frost. If care has been taken to free them from moisture they can be safely left until the next midsummer for the latest planting. We separate Gladiolus-bulbs into two sizes, many of the largest being set apart for early use in pots. These are started in the greenhouse soon after January, and flower in the pots in May, being planted out in the border to mature. Some of the largest bulbs are also kept for late planting. Cultivators of large quantities of Gladioli-bulbs find that the best way to winter their stock is to suspend it in a cellar as already described, except that when many bulbs are stored coarse bags are used, so as to admit air and let the moisture escape. If the bulbs are moist root-action will begin long before planting-time, and the contents of the bags will be a mass of roots that must be broken to separate the bulbs.

This year we have planted out our Gloriosas. They promise to be of more value outdoors than in the greenhouse, as their liability to insects in heat makes it difficult to succeed with them. When planted out there is no trouble of this sort and they flower freely. They may be lifted and stored like the Caladiums after frost has killed them back. It will be found best to start them in heat to bring them forward, or they are likely to remain in the soil half the summer before they begin to grow. Both Gloriosa superba and G. Plantii give satisfaction when used in this way.

Dahlias and Cannas may be stored in a frostproof cellar. Cannas must be placed on a perfectly dry bottom and most of the earth shaken out, or decay from moisture will follow. We once lost our whole collection from this cause. Cannas really need a little warmth to do them justice, especially the newer ones, as they seem to have a tendency to be evergreen. Cannas will also winter perfectly under the benches in a cool greenhouse if boards are placed under the roots. If they are moist they will start to grow before the proper time, and too much space is taken up in the houses when it can least be given. We prefer dry storage in a cellar that would be considered warm.

South Lancaster, Mass. *E. O. Orpet.*

The Forest.

Natural Reforestation on the Mountains of Northern Colorado.—II.

IN noting the conditions that seem favorable to the starting and development of new forest growth, I have frequently seen confirmation of the often repeated and generally accepted statement that north slopes are more quickly covered by new growth than southern. There are occasional exceptions, however. The reason for the difference of growth on the slopes rests, apparently, in the more vigorous action of the sun upon the south slope; the nearly perpendicular rays melt the winter snows, exhaust the soil moisture and parch the vegetation very quickly. Differences in the two slopes are apparent even at the time of burning, and, owing to the greater dryness, vegetation on the south slope will burn more completely. On the north slope the tangle of unconsumed remnants serves as a protection to the young growth and nurses it beyond the critical stage, while on the south slope the young plants, unprotected from the fierce rays of the sun, succumb quickly, and the slope remains barren.

In the lower mountains, at from 7,000 to 8,000 feet, there are several large and a greater number of smaller bodies of young timber that are attractive. The species is almost exclusively Pinus contorta, var. Murrayana, the Lodge Pole Pine. The trees stand thickly together, and the main body of any particular group as seen from a little distance will show a height of from fifteen to twenty feet. Penetrating to the interior of any of these bodies of timber we find that the trees, now green and vigorous, constitute but a small proportion of those that started in the race. The first growth of seedlings must have been very thick, and it seems from observations made that seed continued to germinate for several years after the main body started. Here are found the remains of thousands of young trees that, starved out by their more vigorous neighbors, have died and are slowly returning to the earth from which they came.

Well in from the border of one of these forests, in a spot where Nature's methods had met with no interference, I chose four trees to represent the best development of the forest, not taking the largest, but such as represented the largest number of thrifty trees. The average of these equaled a tree nineteen feet high, 3.8 inches in diameter at the ground, and fifty-two years old, as ascertained from a count of the annual rings. The rate of growth of this average tree for the first fifty years would be as follows:

	Diameter. Inches.	Gain in diameter by decades. Inches.	Percentage of gain by decades.	Percentage of whole by decades.
At ten years, . .	1.			27.6
At twenty years,	2.	1.	100.	55.2
At thirty years, .	2.69	.69	34.5	74.3
At forty years, .	3.19	.5	18 5	88.1
At fifty years, . .	3.62	.43	13 4	

One other tree was taken at this point, chosen for the smallest diameter in proportion to the height. It measured eleven feet eight inches high, was one inch in diameter at the ground, and was by the annual rings thirty-five years old.

Its development by decades was as follows:

	Diameter. Inches.	Gain in diameter by decades. Inches.	Percentage of gain by decades.	Percentage of whole by decades.
At ten years, . .	.25			28.6
At twenty years,	.59	.34	137.5	67.8
At thirty years, .	.87	.28	47.4	

A further observation in this forest, bearing on the thickness of seedlings, and the dying away from starvation, was as follows: From a ground space six inches square grew six trees. The largest was ten feet eight inches high, and 1.38 inches in diameter at the ground, apparently thrifty and vigorous. The next smaller was six feet six inches high, and .75 inches in diameter at the ground. This tree was living, but was plainly less vigorous than the larger one. The next smaller was four feet eight inches high, and .50 inches in diameter at the ground, and was dead. The next smaller was three feet six inches high, and .50 inches in diameter at the ground, living, but weak, and evidently growing weaker, as indicated by the yearly growth. The next was dead and had been broken off at three feet above

the ground. The diameter at the ground was .50 inches. The sixth tree was dead, two feet high, and .25 inches in diameter at the ground.

The areas of young forest here spoken of offer splendid opportunities for the spread of fires when once started, and there is abundant evidence that many such tracts have been entirely destroyed. Timber bodies that have been partially burned are common, and in a few places I have noted evidences, living or dead, of three generations. In one locality examined, the ground under the new growth was thickly covered with the rotting trunks of young trees, and the average of several counts made of the rings of these dead sticks indicated an age of thirty-two years at the time of burning. This would point to 1878 as the probable year when the last fire occurred there. The new growth averaged twelve years, so that in this case six years would appear to have elapsed between the burning and the germination of the seeds in the ground. Four specimens, chosen as being the smallest cone-bearing trees present, gave figures as follows:

	Height. Inches.	Diameter at ground. Inches.	Annual rings.
No. 1,	18	.35	12
No. 2,	14	.40	12
No. 3,	17	.35	10
No. 4,	17	.35	12

The starting of new growth has here been tardy and scanty. The scattering living trees are from twelve to fifteen years old, and I should place the date of burning as at least twenty-five years ago.

Natural processes for reclothing these denuded areas appear from our observations to be very slow; but, unmolested, the task would in time be accomplished. The trouble seems to be that the destructive agency of fire, let loose by the carelessness or viciousness of man, tears down rather faster than Nature can build up, so that, instead of advancing toward a more extended forest area there is a constant retrograde movement. Fires of greater or less magnitude occur every year, and it seems likely to be a matter of a comparatively few years when the whole region, except in much-favored spots, will be stripped of its forests.

Colorado Agricultural College. *Charles S. Crandall.*

Exhibitions.

Chrysanthemums in Boston.

UNFAVORABLE weather during the early part of last week, at the time of the opening of the Chrysanthemum Show in Boston, somewhat lessened the number of exhibits. The two halls were well filled, however, without the usual crowding, and the exhibits were thus placed to good advantage. The size of pots for specimen plants was limited to ten inches, and the specimens were smaller than in former years. This is a step in the right direction, and all plants were uniformly well grown, more even in size than heretofore, and none were of abnormal size. The prizes for plants in pots were about equally divided between Mrs. B. P. Cheney and N. T. Kidder, Esq., and in some instances it was difficult to decide which really excelled. Mr. Kidder secured first prize in the class of twelve plants, and Mrs. Cheney was awarded first honors in most of the other classes. Prizes for plants were also awarded to Mrs. A. W. Blake, for twelve different varieties grown to one stem and one bloom; to James L. Little, Esq., and to Dr. C. G. Weld.

The class of plants with a single flower, grown in a six-inch pot, was well contested this year. A number of exhibitors showed excellent flowers on dwarf plants, such as are specially useful for decorative purposes; all the leading varieties were grown in this way, and were much admired.

The circular groups of Chrysanthemums, arranged for effect, attracted general attention. The group shown by Mrs. A. W. Blake was declared the best, and other exhibitors were Dr. C. G. Weld and J. L. Gardner, Esq. Foliage plants were used among the Chrysanthemums with admirable effect.

Messrs. E. M. Wood & Co., of Natick, had a striking exhibit of cut flowers in vases, ten blooms of one variety. The new Evangeline, white, was conspicuous, not only in this class, but was one of the most admired of all exhibits. The flowers were remarkable for purity of color and solid texture. Mrs. Perrine also showed to advantage. This is, without doubt, the purest pink chrysanthemum in commerce and was notably good in most collections in the exhibition. Messrs. Wood & Co. were also winners in the class of twenty-five blooms. David Nevins, a comparatively recent exhibitor, was among the winners in many classes, and his exhibits this year showed remarkable advance over those in former seasons. Cornelius Vanderbilt, Esq. (Mr. Robert Laurie, gardener), sent some remarkably good flowers from the gardens at Newport. The vase of Peter Kay, a new yellow incurved Chrysanthemum, similar to Major Bonnafon, won first premium as the best new yellow now in commerce. It was recently accorded 87 points in New York by the Chrysanthemum Society of America. A vase of Inter-Ocean, also shown by Mr. Laurie, won first honors among pink flowers. Joseph H. White, Esq., exhibited a new pink incurved flower which resembles Ada Spaulding, but is larger and of deeper color. It has been named Mrs. Gertrude Brydon. This was declared the best incurved Chrysanthemum not in commerce. H. McKay Twombley, Esq., Madison, New Jersey (Mr. A. Herrington, gardener), sent two fine vases of flowers. One of these contained blooms of Frank Hardy, the most sensational flower in the show; these are very deep, the petals being creamy white and somewhat twisted. This novelty is of English origin, and, unlike most English Chrysanthemums, seems well adapted for cultivation here. Another good novelty was Pennsylvania, apparently a sport from Philadelphia, it being identical with that variety in shape, but a beautiful shade of clear yellow. It won a first-class certificate for the exhibitors, Hugh Graham & Son, of Philadelphia. Another notable seedling was a pink incurved Japanese flower shown by Mr. Frederick Cole, gardener to Arthur Hunnewell, Esq. A new primrose-yellow sport from Mrs. H. Robinson was shown by E. M. Wood & Co., of Natick; this has been named Mrs. O. P. Bassett. But few incurved or anemone-flowered kinds were shown. Other winners of prizes for cut flowers were John Simpkins, Esq., Mrs. Cheney, E. S. Converse, Esq., James L. Little and Charles H. Souther.

A table of Orchids, tastefully arranged, was exhibited by Mr. J. S. Bailey. This comprised well-grown examples of Cattleya labiata, Oncidium Rogersii and a superb variety of Miltonia Moreliana, called atro-rubens. The latter was awarded a certificate for its unusual depth and richness of color.

A creditable display of early-flowering Carnations was made by Mr. Nicholson, of Framingham, his vase of Mrs. George M. Bradt being the finest fancy variety shown; it is similar to Helen Kellar, but superior to that fickle sort, and is, no doubt, the best fancy Carnation of that color. Mr. Peter Fisher also showed a new variety called Mrs. T. W. Lawson, a bright rose-pink. This is not yet in commerce, but has been tried for three years, and has proved its good qualities. It is altogether the brightest carnation in this color. Better names are needed for new Carnations; the commemorative and descriptive titles are apt to be cumbersome, are soon abbreviated, and lose their original significance.

Gratuities were awarded for flowers to Mrs. E. M. Gill for chrysanthemums; to William Nicholson for chrysanthemums and carnations. J. J. Van Alan, Esq. (Arthur Griffin, gardener), received a silver medal for the hybrid Begonia semperflorens. A first-class certificate was awarded to Peter Fisher for carnations. A. Roper received Honorable Mention for carnation Mayor Quincy, and Joseph Hilbert, Nyack, New York, for a sport of Swainsonia.

Notes.

Ben Davis apples, considered inferior here, seem to have won favor in Germany through their showy color and good-keeping qualities, and a sale of American fruit of this variety is reported to have realized $6.01 a barrel, wholesale, on November 2d, in Hamburg.

Among the plants which assume brilliant coloring late in the autumn none equals, perhaps, our common high-bush Blueberry, Vaccinium corymbosum, which early in November lights up many northern swamp borders with its flaming foliage. The value of this Blueberry as a garden plant has been often insisted on in the columns of GARDEN AND FOREST, but we cannot refrain from repeating that it is one of the most beautiful of all hardy shrubs. Beautiful in early spring with

its waxy-white bell-shaped flowers, beautiful in summer with its bright blue fruit, and especially beautiful now after the leaves have turned. It is a tall shrub and in good soil soon grows into a shapely specimen.

The change from northern-grown to southern fresh vegetables has gradually taken place in our markets, while the weather in this section is yet delightfully bright and mild, with hardly any suggestion of approaching winter. Peppers, cucumbers and the first tomatoes are now coming from fields in Florida. Eggplants and okra come from the same state, and green peas from Virginia. The supplies of string beans are received from Virginia and from North and South Carolina.

Prunus subhirtella is another Japanese Cherry which promises to become a valuable ornamental plant in our northern gardens. Like Prunus pendula, which it resembles also in the structure and size of the flowers, it blooms before the appearance of the leaves. In the Arnold Arboretum, where Prunus subhirtella has proved hardy and flowered abundantly for the last two or three years, it is now a broad bush with slender erect branches and ovate-acuminate dark green leaves from two to three inches in length. About the first of November these turn deep rich purple-red, making this plant a beautiful object at this season of the year. Altogether, Prunus subhirtella is one of the hardiest and most promising of the small trees recently introduced into our gardens. It was figured a year ago in *The Botanical Magazine* (t. 7508) from a plant sent in 1895 by the Arnold Arboretum to the Royal Gardens at Kew.

The two native species of dwarf Pyrus, or Choke-berries, Pyrus nigra and Pyrus arbutifolia (see Garden and Forest, vol. iii., p. 416, f. 52), are both good garden shrubs. At this season of the year, when the former has already lost its leaves, and its fruit, although still hanging on the branches, is much shrunken, Pyrus arbutifolia is the more attractive plant. It is a tall, slender bush with oblong or oblanceolate leaves, abundant white flowers which open about the 1st of June, and small fruits which do not ripen until the end of October, when they become bright scarlet and remain on the branches without loss of color or brilliancy until well into the winter. The leaves turn dark red about the time the fruit becomes ripe, and at this season this is one of the most attractive of our native shrubs. The habit is not as good as that of some others, but, in spite of this drawback, Pyrus arbutifolia may well find a place in any garden for the beauty of its autumn colors and the winter effects produced by its fruits.

Oranges from Louisiana and from Jamaica are now in this market, and the celebrated Indian River oranges, from Florida, are seen in considerable quantity for the first time since the ruinous freeze in that state in 1895. Several carloads of high-grade Florida oranges from the section about Arcadia have been forwarded to this city during the past few days. A carload of new-crop Navel oranges is already on the way from California to New York, having been started across the continent on November 6th, and is due here ten days later. It is said to be the first carload of this fruit shipped from that state this season. Besides Messina and Malaga lemons, from the Mediterranean, new-crop lemons of choice quality are arriving from California. Twenty-six carloads of so-called deciduous fruits, from California, were sold in this city last week. Grapes constituted almost the entire bulk, the principal varieties being Flame Tokay, Muscat, Cornichon, Verdell and Black Ferrera. Delaware and Niagara grapes, from Lake Keuka and more westerly parts of New York, are passing out of season, together with Concords. Keiffer, Beurre d'Anjou, Lawrence, Vicar of Wakefield, Beurre Bosc and Seckel pears, from near-by orchards, are still fairly plentiful, the latter costing more than twice as much as any of the other sorts.

In a paper read before the last meeting of the Society for the Promotion of Agricultural Science, on The Weights of Bees and the Loads they Carry, Professor Clarence P. Gillette, of the Colorado Agricultural College, reported that in his examinations of hundreds of pollen-bearing bees he had never found one heavily laden with honey, though these usually have a little honey, as do most working bees when leaving for the field. A carefully compiled table included in Professor Gillette's paper shows that the honey-carriers return to the hive a trifle more than one-half heavier than when they leave it, but the pollen-carriers, on an average, only increase their weight about one-tenth by the load they carry. The same table demonstrates that the bees from an issuing swarm are considerably heavier than bees coming to the hive laden with honey, proving that they take as much food as possible with them when swarming, to guard against starvation before it is possible to again gather in stores for the new home. According to this table there are in one pound, on an average, 5,578 unloaded worker bees, and for the same weight 3,532 honey-laden bees are necessary. As many as 5,060 pollen-bearing bees or 5,447 unloaded pollen-bearers are required to weigh one pound, or 5,394 idlers; 2,206 drones; 10,965 loads of honey; or 40,580 loads of pollen, this amount representing the quantity of pollen carried on both legs by the bees.

In a recent number of *The Botanical Magazine*, Sir Joseph Hooker describes and figures (t. 7522) under the name of Wistaria Chinensis, var. multijuga, the Wistaria with long racemes which is so commonly cultivated in Japanese gardens and which has been grown in this country for the past twenty-five or thirty years. There is considerable confusion still with regard to the names of the Asiatic species of this genus; but this question need not be discussed here, and the object of this note is merely to call attention to a beautiful hardy vine which is not as well known as it should be. It differs from the ordinary Wistaria Chinensis in its narrower leaflets, much longer and looser racemes of very fragrant flowers and in their lateness, as the flowers of this plant open two or three weeks later than those of Wistaria Chinensis. In the autumn the two species can be readily distinguished, as the leaves of Wistaria multijuga turn clear yellow comparatively early, while those of Wistaria Chinensis remain green so late that they are almost invariably destroyed by frost before changing color. Wistaria Chinensis is a common Japanese forest plant and is also a native of China. Wistaria multijuga does not appear to be indigenous in Japan, and, judging from the fact that it is much hardier than Wistaria Chinensis, it probably came originally from northern China, and is one of those favorite garden plants of the Japanese introduced to them by the Buddhist priests. Whatever the right name for this handsome plant may be, it is evidently in every way entirely distinct from the common Japanese Wistaria, the plant universally cultivated in this country and Europe as Wistaria Chinensis.

In a paper on Thinning Fruit, recently read before the Hudson Valley Horticultural Society, Professor S. A. Beach gave an account of experiments in thinning fruit on Apple-trees. In the first experiment two heavily-fruited Baldwin trees were selected, and all the knotty, wormy and otherwise inferior fruit was picked off one of the trees, leaving but one fruit of a cluster. Of marketable fruit the thinned tree yielded nine and four-fifths per cent more first-grade, and four and one-half per cent less second-grade fruit than the unthinned tree. Six Baldwin and six Greening trees were used in the second experiment. Three trees of each kind were thinned by taking off all poor fruit and leaving the fruit on the trees at least four inches apart. The Baldwin trees which had been thinned gave twenty-six per cent less of marketable fruit, but twenty-two per cent more of it graded No. 1 than of the fruit from the unthinned Baldwins. Or, differently stated, although the unthinned trees carried above a fourth more fruit altogether, they actually each yielded one and a quarter bushels less No. 1 fruit than the thinned trees. With the Greenings this difference was even more marked, for the thinned Greening trees on an average produced two and one-quarter bushels more No. 1 fruit than the unthinned trees. Two trees of Hubbardston were used in the third test. On one tree the fruit was thinned to at least six inches apart. The thinned tree bore seventeen and four-tenths per cent more of No. 1 apples than the unthinned tree, and seventeen and one-tenth per cent less of No. 2 grade. In all these tests fewer apples dropped from the thinned trees, and their fruit was superior in quality and more highly colored, and was worth from ten to fifteen per cent more in market. The thinning and picking took about twice the time required for picking alone. The second method in these tests proved superior enough to the first to more than pay for the extra work involved; that is to say, the work paid best where it was thoroughly done. From the figures now at hand a satisfactory comparison of the second and third methods cannot be made, nor of the effect of thinning the fruit on the succeeding crop. In a season of an enormous crop, as in 1896, when many growers did not realize returns sufficient to cover the cost of packages and of picking and handling, thinning early in the season might be expected to decrease the yield of low-grade fruit and increase the amount of first grade, with a consequent advance in prices. Relieved of the drain of excessive bearing, the trees could ripen a fairly large crop of superior fruit, and better develop fruit-buds for the following year.